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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HARRISON, MONICA D

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,996

Applicant(s)

LEE, JU-IL

Examiner

Monica D. Harrison

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment filed 2/2/05 has been entered. Examiner acknowledges claims 5-8 and 10-11 have been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang et al (6,180, 969 B1).

2. Regarding claim 1, Yang et al discloses a method for fabricating a CMOS image sensor including a low voltage buried photodiode and a transfer transistor, the method comprising: a) forming a field oxide (Figure 7C, reference 707) for defining an active area and a field area (column 7, lines 14-17) on a certain area of an epitaxial layer (Figure 7C, reference 702) formed on a substrate (Figure 7C, reference 701), and forming a gate (Figure 7D, reference 711) of a transfer transistor (column 7, lines 34-39) on the epitaxial layer of the active area; b) forming a low voltage buried photodiode doping region in alignment with one side of the gate of the transfer transistor (Figure 7I, reference LVPD); c) forming a spacer insulation layer by stacking layers of oxide and nitride over the whole structure (Figure 7C; reference 706); d) forming a spacer block mask (Figure 7I, reference 727) on the spacer insulation layer to open areas opposite the transfer transistor from the low voltage buried photodiode doping region while leaving the photodiode doping region covered by the spacer insulation layer and spacer block

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mask (Figure 7I); and removing the spacer insulation layer not covered by the spacer block mask to form a spacer on a sidewall of the transistor, removing the spacer block masks forming a second mask over the portion of the spacer insulation layer remaining on the photodiode doping region and leaving the area opposite the transistor open (Figure 7I), and forming a floating diffusion region on the open area opposite the transfer transistor from the photodiode doping region while the second mask and the remaining portion of the space insulation layer is in place over the photodiode doping region (Figures 7I and 7J).

3. Regarding claim 3, Yang et al discloses wherein part b) further comprises: sequentially performing n-type ion implantation and p-type ion implantation using a first mask with an opening disposed over the low voltage buried photodiode doping region (column 6, lines 63-67 thru column 7, lines 1-13; Figure 7A, reference 703).

4. Regarding claim 4, Yang et al discloses wherein the spacer block mask of part d) is formed using the first mask of part b) and a negative photoresist (Figure 4, reference 41).

5. Regarding claim 9, Yang et al discloses a CMOS image sensor made in accordance with the method of claim 1 (Figures 7A-7I).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (6,180,969 B1) in view of Rhodes 6,611,037 B1).

6. Yang et al discloses all above claimed subject matter except wherein the oxide layer of the spacer insulation layer has a thickness ranging from about 200 Angstroms to about 2000 Angstroms, and the nitride layer of the spacer insulation layer has a thickness ranging from about 200 Angstroms to about 1000 Angstroms.

Rhodes discloses wherein the oxide layer and nitride layer of the spacer insulation layer has a thickness ranging from about 20 Angstroms to about 500 Angstroms however, Rhodes does not teach the specified parameters for the layers of claim 2.

It would have been obvious, at the time the invention was made, for one with ordinary skill in the art, to provide a oxide layer of the spacer insulation layer has a thickness ranging from about 200 Angstroms to about 2000 Angstroms, and the nitride layer of the spacer insulation layer has a thickness ranging from about 200 Angstroms to about 1000 Angstroms, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the "optimum range" involves only routine skill in the art. *In re Aller*, 105 USPQ 233, 1955.

Response to Arguments

7. Applicant's arguments with respect to claims 1-4 and 9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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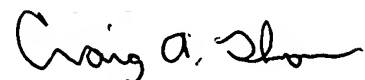
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica D. Harrison whose telephone number is 571-272-1959. The examiner can normally be reached on M-F 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monica D. Harrison
AU 2813



CRAIG A. THOMPSON
PRIMARY EXAMINER

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mdh

April 22, 2005